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The Dynamics of Changing Comparative Advantage in ASEAN-4: Flying Geese Model

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A B S T R A C T

Globalization makes all the economic activities of the country becomes more open. Trade openness leads to increasingly fierce competition conditions and then raises a competitiveness. This competitiveness is the key for each country to develop products to be exported. Competitiveness is one of the criteria that determine the success of a country in international trade. This study aims to analyze the dynamics of changes in comparative advantages occurring in ASEAN-4 countries (Indonesia, Philippines, Malaysia and Thailand) in 1989 to 2016 using Product Mapping method which combines calculations between RSCA and TBI in each product classification. The results show that each country has different comparative advantages, including Indonesia which has a comparative advantage for unskilled-labor product classification (TPT and garment) and on primary product (oil and its derivative products) and is the leader for both products. Then the Philippines has a comparative advantage for the classification of technology intensive products (electronics) which is also a leader in the product. In addition, the results of research also found a change in comparative advantage as well as product specialization, including Thailand which no longer has a comparative advantage on human-capital intensive products (rubber and derivative products) but still a net-exporter. So it is with Indonesia who no longer has a comparative advantage on natural-resource products (lead) but still a net-exporter.

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INTRODUCTION

The era of globalization makes all the economic activities of the country becomes more open. Economic and trade openness provides the consequences of two things at once, namely challenges and opportunities. The more open trade between countries with other countries can provide opportunities for increased access to domestic goods and services market in international markets as well as challenges to the competitiveness of domestic industry towards foreign products. Almost every country today can not ignore its economic interaction with other countries. Fulfilling the need for goods and services for consumers and the needs of producers for greater market coverage creates wider trade relations and greater integration, thereby creating interdependence among the countries involved (Ghosh, 2014). The involvement of countries in an international trade activity is inseparable from the resources available in each country or commonly called endowment factors and the addition of technology that continues to grow over time (Rana, 1990; Pelli and Tschopp, 2017). In accordance with Porter (1995) which states that inter-state trade occurs due to differences in production factors owned by each country to be used directly.

Trade openness resulted in increasingly fierce competition conditions because each country opened its market. This openness of the market indicates the existence of free trade which then creates a competitiveness where in the case of free trade among ASEAN countries specifically cause ASEAN countries to compete with each other in the international arena. This competitiveness is the key for every country in developing the products to be exported. Competitiveness is one of the criteria that determines the success of a country in international trade. Theoretically, the problem of competitiveness is explained by various theories, one of which is by Porter (1995) which states that competitiveness is the ability of a commodity to enter the foreign market and the ability to survive in that market. In international trade, the competitiveness of a commodity can be seen from its comparative advantage known through RCA calculation of the commodity. David Ricardo in Salvatore (2014) says that comparative advantage will be achieved if a country is able to produce more goods and services at a lower cost than other countries. In other words the country specializes in the production of goods or services that have high productivity and efficiency. Changes in the performance of a country's international trade depend on the dynamics of the country's own comparative advantage. Countries that are rapidly able to capture a process are likely to have also demonstrated rapid structural transformation and have an impact on changing patterns of comparative advantage (Widodo, 2008). The movement or dynamics of comparative advantage in a country can be known through the Flying Geese pattern. The Flying Geese pattern is one of the most recognizable models with strong consideration in explaining the economic development of a country. Flying Geese is a theory to explain the effects of developing manufacturing industries in developing countries (Kojima, 2000; Ozawa, 2001; Kwan, 2002; Kasahara, 2004 and Ruan, 2014). This Flying Geese model aims to overcome the pursuit of industrialization in developing an open economy. In line with the purpose of the model, the flying geese pattern will be able to explain the economic development and dynamics of comparative advantage in each ASEAN-4 country.

METHODS

Data

The calculations in this study use export and import data published by the United Nations Commodities Trade Statistics Database (UN-COMTRADE) by using the trade classification of Standards Inter-

national Trade Classification (SITC) Revision 2 covering 34 products with a period of research in 1989 to 2016 in the form of annual data. The products used in this research are petroleum, tin, textile and garment, electrical and electronic products, and rubber and its derivative products.

Product Mapping: RSCA and TBI Indexes

Data analysis method used in this research is product mapping, where the mapping of this product was developed to test Flying Geese pattern. As mentioned in the Flying Geese concept, there are two important variables involved in the Flying Geese pattern, namely comparative advantage and export-import (trade balance). Therefore, this analysis tool is built by combining two variables. Thus, two indicators are selected, namely Revealed Symmetric Comparative Advantage (RSCA) as an indicator of comparative advantage and Trade Balance Index (TBI) as an indicator of export-import activities. The RSCA index is formulated as follows (Laursen, 1998):

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

The $RSCA_{ij}$ index ranges from minus one to one ($-1 \leq RSCA_{ij} \leq 1$). If $RSCA_{ij}$ is greater than zero states that country i has a comparative advantage in product group j. Conversely, if $RSCA_{ij}$ is less than zero states state i has a comparative weakness in the product group j.

The Trade Balance Index (TBI) is applied to analyze whether a country has specialized in export (as a net-exporter) or import (as a net-importer) for a particular group (Lafay, 1992). TBI is formulated as follows:

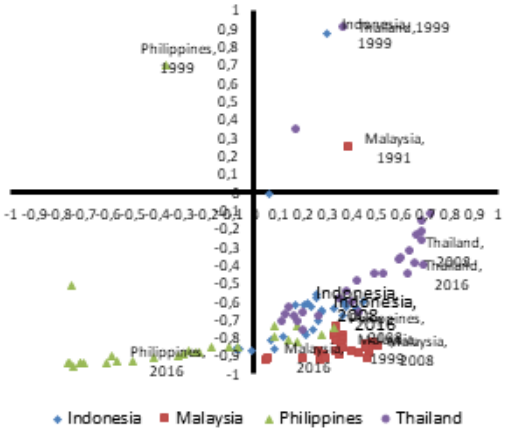
$$TBI_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}$$

Where TBI_{ij} shows the country's trade balance index i for product group j; X_{ij} and M_{ij} respectively represent export and import of product group j by country i. This index ranges from -1 to 1 ($-1 \leq TBI_{ij} \leq 1$). TBI equals minus one if a country is just imported, on the contrary, TBI equals one if a country only exports.

RESULTS AND ANALYSIS

Results

ASEAN is a diverse region in terms of endowment factors, human resource development, technological capabilities, and productivity. The presence of such diversity is reflected in different export patterns across member countries. This study uses



Source: Comtrade, processed

Figure 1. Human-Capital Intensive Product for Rubber Products and Derivative Products 1989-2016

four ASEAN countries including, Indonesia, Malaysia, Philippines and Thailand. These four countries have the same characteristics that is a developing country that has the potential in natural resources and human resources. The figure 1 is the result of product mapping for ASEAN-4 countries. The results were obtained from RSCA and TBI calculations in each ASEAN-4 country based on product classification.

The picture 2 is known that Thailand has a comparative advantage that makes Thailand as a leader goose for rubber commodities. Followed by Indonesia who became the first follower goose. Then the second follower goose is Philippines.

Indonesia's superior position is seen in product mapping, making Indonesia as leader goose for tin commodities. This condition persists until the following years where Indonesia is still a leader goose for this commodity. Then it was seen that Malaysia became the first follower goose. Next the second follower is the Philippines.

The picture 4 can be seen that in 1991 Indonesia excelled over petroleum commodities. Indonesia's superior position, making Indonesia a leader goose for petroleum commodities. But in 2009 there was a shift in position and hierarchy, where Indonesia shifted the original leader into

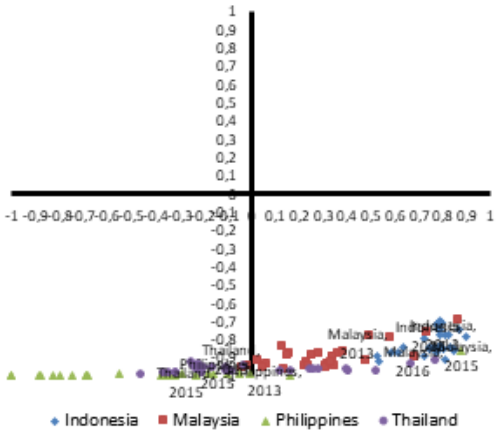


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Figure 2. Natural-Resource Intensive Product for Tin Products 1989-2016

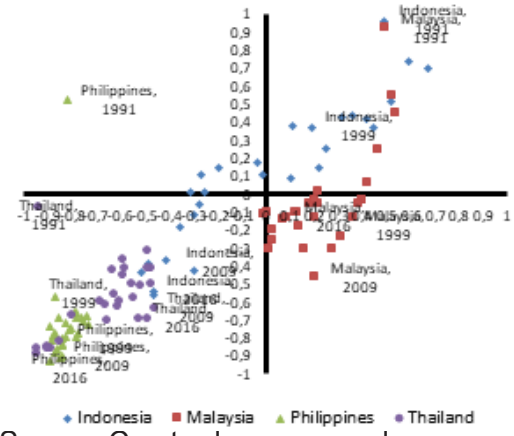

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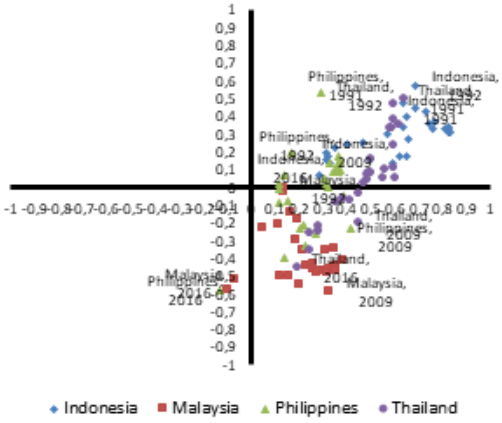
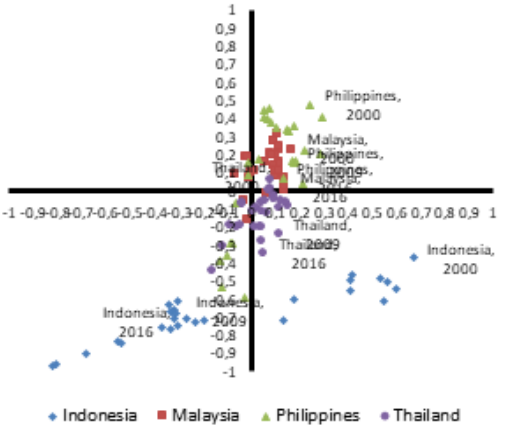
Figure 3. Primary Product for Petroleum Products and Its Derivative Products 1989-2016



Source: Comtrade, processed

Figure 4. Unskilled-Labor Intensive Product for Textile and Textile Products (TPT) and Garments Year 1989-2016



Source: Comtrade, processed

Figure 5. Technology-Intensive Product Mapping for Electrical and Electronic Products 1989-2016

a follower replaced by Malaysia. The position and hierarchy are unchanged until 2016 where Malaysia becomes a leader.

Indonesia excels over textile and garment commodities where Indonesia has a comparative advantage and is a net exporter country. Indonesia's superior position, making Indonesia as leader goose for textile and textile products (TPT) and garment. Thailand became the first follower goose. Next the second follower goose is Philippines.

The superior Philippine position is seen in the mapping of the above products, making the Philippines as a leader goose for electronic product commodities. Malaysia became the first follower goose, then the second follower goose is Thailand.

Analysis

The results of RSCA and TBI calculations, which were then shaped into product mapping, showed that Thailand excelled in rubber products followed by Indonesia in second place and then Malaysia ranked third and last in the Philippines. The position formed in the mapping of the product also shows that in the classifica-

tion of human-capital intensive product for rubber products, Thailand is the leader of goose, Indonesia is the first follower. Malaysia and the Philippines are the second follower goose. These findings support the research of Yussof (2002) and Jayadi (2016) that comparative advantage is not only based on endowment factor, but also by competitiveness components, ie low production costs, openness, achievement of human capital capital, and technological progress. Thailand shows that human capital is a source of comparative advantage. As the world's largest exporter and rubber producer, Thailand's natural rubber production and consumption continue to show consistent growth over the past few years at an annual growth rate of 5.81% and 5.39%. Thailand's leading position is supported due to its abundant natural resources, labor, accessibility, and strategic location in the Asia Pacific region.

Then on the classification of natural-resource intensive product for tin products, RSCA and TBI calculations are then shaped into product mapping showing Indonesia's superior position on tin products, followed by Malaysia in second position, the Philippines is third and Thailand occupy the last position. Indonesia is superior to this tin product, making Indonesia as the leader of goose, Malaysia as the first follower goose, Philippines and Thailand as the second follower goose. These results support Holst's research finding that Indonesia's superiority is positive and significant in resource-based industrial products groups and in low technology products (Holst, 2004). Indonesia ranks second in the world with the largest tin reserves in the world, after China. By 2016 Indonesia's tin production has declined due to government regulations on sustainability of natural resources, supporting the creation of good mining practices through the Clear and Clean (CnC) process, enhancing the added value of lead, and ensuring traceability of tin raw materials. Indonesia's tin exports peaked in 2012 at 130,809 tons, then down 37% in 2013 to 82,954 tons (Ministry of ESDM, 2016).

In the primary product classification for petroleum products and their derivative products, the product mapping results show Indonesia excelled for petroleum products in 1999 which also placed Indonesia as the leader of goose. But in 2009 there was a change of position hierarchy where Indonesia was replaced by Malaysia. While Indonesia shifted to the first follower goose followed by the Philippines and Thailand as the second follower goose. Broadly speaking, the position change is due to the downward trend in comparative advantage and the trade balance of each country. This result is supported by the findings of Wong and Chan (2003) who found that initially the economies of ASEAN countries (except Singapore) were based on natural resources (economic growth dependent on natural resource exports and primary products) which since 2001 ASEAN trade has shifted from primary products to processed products.

Furthermore, in the classification of unskilled-labor intensive product for textile and textile products (TPT) and garment. The mapping of the products shows that Indonesia excels in textile products (TPT) and garment and puts Indonesia as the leader of goose, followed by Thailand who became the first follower goose, then the Philippines and Malaysia who became the second follower goose. Although it tends to experience a downward trend, Indonesia remains superior to this classification. These results support Myo's (1994) research that Indonesia's source of excellence is unskilled labor, basic technology, natural resources, undeveloped lands, and Kumar's research (1994) which shows that Indonesia has the advantage of low-wage labor. It is also in accordance with the findings of Widodo (2008) where China along with Thailand and Indonesia have comparative advantages in the unskilled labor-

intensive industry.

Last is the classification of technology-intensive product for electrical and electronic products. The results of the product mapping showed that the Philippines excelled in electrical and electronic products (E & E) which later placed the Philippines as the leader of goose, followed by Malaysia as the first fellow goose, Thailand and Indonesia as the second follower goose. This result is in accordance with research Sabaruddin (2015) where the advantages of export comparative illustrates that the development trend of Indonesia's export competitiveness structure is now more diversified and become a country that previously exported based on natural resources, now becoming a country where the manufacturing sector has contributed to boosting Indonesia's exports with high competitiveness.

The Philippine electronics industry began in the mid-seventies as industrialized nations moved their production facilities to third world countries to control increases in production costs. The Philippines is an ideal relocation site due to competitive, highly educated and English-speaking labor costs. Other factors include the country's geographical location (at the crossroads of international trade), and attractive government incentives. Conditions that prompted foreign electronics companies to move to the Philippines remained and were further enhanced by the country's political transition to popular democracy in 1986 (DTI, 2011). Since then, the industry has grown rapidly and outpaced the agricultural sector as an industry that contributed to the Philippines' main export earnings in 1996. This is consistent with Mayer's (2002) findings that a group of technology-intensive products, such as computers, computer parts, office machines, optical instruments and electrical equipment are the most dynamic export products.

CONCLUSIONS

The results of the discussion presented in the form of descriptive and quantitative analysis of the dynamics of changes in comparative advantage in the four ASEAN countries as a whole can be drawn the following conclusions:

1. The flying geese pattern formed in ASEAN 4 countries shows that Indonesia is a goose leader and has a comparative advantage in primary product and unskilled laboratory (TPT and garment). Then the Philippines became the leader of goose and has a comparative advantage on technology intensive product (electricity and electronic products).
2. RSCA and TBI calculations show that there is a change in comparative advantage as well as product specialization in Indonesia and Thailand, where Indonesia no longer has a comparative advantage on tin products but is a net-exporter for the product, as well as Thailand which no longer has a comparative advantage for rubber products but Thailand remains a net-exporter for the product.

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